under sail for protected waters or partially protected waters, in lieu of conducting a simplified stability proof test.

(f) Commanding Officer, Marine Safety Center, may prescribe additional or different stability requirements for a broad, shallow draft vessel with little or no ballast outside the hull.

§ 178.330 Simplified stability proof test.

(a) A vessel must be in the condition specified in this paragraph when a simplified stability proof test is performed.

(1) The construction of the vessel must be complete in all respects.

(2) Ballast, if necessary, must be in compliance with §178.510 and must be on board and in place.

(3) Each fuel and water tank must be approximately three-quarters full.

(4) A weight equal to the total weight of all passengers, crew, and other loads permitted on the vessel must be on board and distributed so as to provide normal operating trim and to simulate the vertical center of gravity causing the least stable condition that is likely to occur in service. Unless otherwise specified, weight and vertical center of gravity is assumed to be as follows:

(i) The weight of primary lifesaving equipment should be simulated at its normal location, if not on board at the time of the test;

(ii) The weight of one person is considered to be 72.6 kilograms (160 pounds) except the weight of one person is considered to be 63.5 kilograms (140 pounds) if the vessel operates exclusively on protected waters and the passenger load consists of men, women, and children;

(iii) The vertical center for the simulated weight of passengers, crew, and other loads must be at least 760 millimeters (2.5 feet) above the deck; and

(iv) If the vessel carries passengers on diving excursions, the total weight of diving gear must be included in the loaded condition as follows:

(A) The total weight of individual diving gear for each passenger carried is assumed to be 36 kilograms (80 pounds), which includes the weight of scuba tanks, harness, regulator, weight belt, wet suit, mask, and other personal diving equipment; and

(B) The weight of any air compressors carried.

(v) On vessels having one upper deck above the main deck available to passengers, the weight distribution must not be less severe than the following:

Total Test Weight (W) = ____
Passenger Capacity of Upper Deck: ____
Weight on Upper Deck = (# of Passengers on Upper Deck) × (Wt per Passenger) × 1.33''
Weight on Main Deck = Total Test Weight − Weight on Upper Deck

(5) All non-return closures on cockpit scuppers or on weather deck drains must be kept open during the test.

(b) A vessel must not exceed the limitations in paragraph (f) of this section, when subjected to the greater of the following heeling moments:

$M_p = (W)\ (B_p)/6$; or
$M_w = (P)\ (A)\ (H)$

where:

M_p = passenger heeling moment in kilogram-meters (foot-pounds);

W = the total passenger weight using 72.6 kilograms (160 pounds) per passenger, or, if the vessel operates exclusively on protected waters and the passenger load consists of men, women, and children, 63.5 kilograms (140 pounds) per passenger may be used;

B_p = the maximum transverse distance in meters (feet) of a deck that is accessible to passengers;

M_w = wind heeling moment in kilogram-meters (foot-pounds);

P = wind pressure of:

(1) 36.6 kilograms/square meter (7.5 pounds/square foot) for operation on protected waters;

(2) 48.8 kilogram/square meter (10.0 pounds/square foot) for operation on partially protected waters; or

(3) 73.3 kilograms/square meter (15.0 pounds/square foot) for operation on exposed waters;

A = area, in square meters (square feet), of the projected lateral surface of the vessel above the waterline (including each projected area of the hull, superstructure and area bounded by railings and structural canopies). For sailing vessels this is the bare poles area, or, if the vessel has no auxiliary power, with storm sails set; and

H = height, in meters (feet), of the center of area (A) above the waterline, measured up from the waterline.

(c) For sailing vessels the heeling moment used for this test must be the greater of the following:

(1) Passenger heeling moment from paragraph (b) of this section.

(2) Wind heeling moment from paragraph (b) of this section.

(3) Wind heeling moment calculated from the wind heeling moment equation in paragraph (b) of this section, where:

M_w = wind heeling moment in kilogram-meters (foot-pounds);
P=4.9 kilograms/square meter (1.0 pounds/square foot) for both protected and partially protected waters.
A=the windage area of the vessel in square meters (square feet) with all sails set and trimmed flat;
H=height, in meters (feet), of the center of effort of area (A) above the waterline, measured up from the waterline; and

(d) A vessel must not exceed the following limits of heel:

(1) On a flush deck vessel, not more than one-half of the freeboard may be immersed.

(2) On a well deck vessel, not more than one-half of the freeboard may be immersed, except that, on a well deck vessel that operates on protected waters and has non-return scuppers or freeing ports, the full freeboard may be immersed if the full freeboard is not more than one-quarter of the distance from the waterline to the gunwale.

(3) On a cockpit vessel, the maximum allowable immersion is calculated from the following equation:

(i) On exposed waters—

$i=f(2L–1.5L')/4L$

(ii) On protected or partially protected waters—

$i=f(2L-L')/4L$

where:

i=maximum allowable immersion in meters (feet);
f=freeboard in meters (feet);
L=length of the weather deck, in meters (feet); and
L′=length of cockpit in meters (feet).

(4) On an open boat, not more than one quarter of the freeboard may be immersed.

(5) On a flush deck sailing vessel, the full freeboard may be immersed.

(6) In no case may the angle of heel exceed 14 degrees.

(e) The limits of heel must be measured at:

(1) The point of minimum freeboard; or

(2) At a point three-quarters of the vessel's length from the bow if the point of minimum freeboard is aft of this point.

(f) When demonstrating compliance with paragraph (d) of this section, the freeboard must be measured as follows:

(1) For a flush deck or well deck vessel, the freeboard must be measured to the top of the weatherdeck at the side of the vessel; and

(2) For a cockpit vessel or for an open boat, the freeboard must be measured to the top of the gunwale.

(g) A ferry must also be tested in a manner acceptable to the cognizant OCMI to determine whether the trim or heel during loading or unloading will submerge the deck edge. A ferry passes this test if, with the total number of passengers and the maximum vehicle weight permitted on board, the deck edge is not submerged during loading or unloading of the vessel.

[CGD 85–080, 61 FR 966, Jan. 10, 1996; 61 FR 20557, May 7, 1996, as amended at 62 FR 51356, Sept. 30, 1997; 62 FR 64306, Dec. 5, 1997]

§ 178.340 Stability standards for pontoon vessels on protected waters.

(a) The portion of the deck accessible to passengers on a pontoon vessel must not extend beyond the outboard edge of either pontoon, nor beyond the forward or aft ends of the pontoons.

(b) A pontoon vessel that has more than 2 pontoons or has decks higher than 150 milimeters (6 inches) above the pontoons must meet a stability standard acceptable to the Commanding Officer, Marine Safety Center.

(c) A pontoon vessel must be in the condition described in §178.330(a) of this part when the simplified stability proof test is performed, except that the simulated load of passengers, crew, and other weights is initially centered on the vessel so that trim and heel are minimized.

(d) A pontoon vessel has the minimum acceptable level of initial stability if it meets the following:

(1) With the simulated load located at the extreme outboard position of the deck on the side with the least initial